Ghana - Regulatory Strengthening

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Overview

Identification

COUNTRY
Ghana

EVALUATION TITLE
Regulatory Strengthening

EVALUATION TYPE
Independent Evaluation

ID NUMBER
DDI-MCC-GHA-IE-ENERGY-REGSTR-2019-v01

Version

VERSION DESCRIPTION
- v01: Edited, anonymous dataset for public distribution.

Overview

ABSTRACT
The objective of the Regulatory project is to promote sustainability, transparency, and accountability in the power sector through strengthening regulatory processes, reviewing and restructuring tariffs, and improving the environment for private sector investments. The performance evaluation of the Regulatory project will focus on assessing the project's implementation, progress toward achieving outcomes, and its longer-term sustainability, including the existence of a cost-reflective tariff and greater access to power for the poor. The methodological approach for the performance evaluation of the Regulatory project relies on tracking key outcomes over time to assess pre-post changes, qualitative data analysis, simulation, and a political economy analysis to understand institutional incentives. The objectives of the Regulatory project are closely linked to those of the EFOT project. In many cases, addressing the research questions below will capture the combined effects of the projects. Evaluation questions include: 1. Did the project result in cost-reflective tariffs or tariffs that were on track to be cost-reflective by the end of the compact (cost-reflect means tariffs that tracked inflation, sector costs, macroeconomic performance, and exchange rates)? 2. To what extent were tariff changes driven by reforms to the tariff structure and methodology versus other factors (such as inflation, macroeconomic performance, exchange rates)? 3. Did "hidden costs" drop when project activities were implemented? If so, to what extent can this be attributed to the project activities? 4. Did the project contribute to improved tariff targeting and greater access to power for the poor? How were the benefits distributed among the different stakeholders? 5. Were projects activities implemented as designed? How did implementation (in terms of objectives, activities and beneficiaries) deviate from the original logic driving the investment, and why? How did changes in implementation affect project performance? What were the implementation successes and challenges? Are distribution utilities meeting performance targets set by the regulator? Why or why not? 6. Does the regulator have the data necessary to measure sector performance? If yes, do those data influence their decisions and how they implement the tariff formula? 7. Were improvements in project outcomes sustained after the end of the compact? What sustainability planning was done during implementation, and why? What are the critical institutional factors that affected their sustainability?

EVALUATION METHODOLOGY
pre-post, other (performance evaluation)

UNITS OF ANALYSIS
Indivdiuals, households, enterprises, administrative units

KIND OF DATA
SD, ADM, OBS, PRO

TOPICS

Topic	Vocabulary	URI
Energy	MCC Sector	

KEYWORDS
Ghana, Ghana compact, power, energy, electricity, energy sector reform, tariffs, tariff reform, regulation

Coverage

GEOGRAPHIC COVERAGE
All of Ghana.

UNIVERSE
The evaluation will use a variety of data source for the regulatory project performance evaluation, including a combination of implementation and project records, administrative data, external surveys, and KIIs.

Producers and Sponsors

PRIMARY INVESTIGATOR(S)

Name	Affiliation
Mathematica	

FUNDING

Name	Abbreviation	Role
Millennium Challenge Corporation	MCC	

Metadata Production

METADATA PRODUCED BY

Name	Abbreviation	Affiliation	Role
Mathematica			Independent Evaluator

DATE OF METADATA PRODUCTION
2019-07-29

DDI DOCUMENT VERSION
Version 01

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MCC Compact and Program

COMPACT OR THRESHOLD
Ghana II Compact

PROGRAM
The Ghana II Compact aims to improve the quality and reliability of power distribution systems; support regulatory reforms to promote private sector partnership and long-term financial sustainability; improve access to legal connections for micro, small, and medium-sized enterprises (MSMEs); and promote energy efficiency to manage demand growth. The compact comprised the four following projects designed to address critical challenges facing the electricity sector: (1) the ECG Financial and Operational Turnaround Project (EFOT), which was designed to improve ECG's management and efficiency by introducing private sector participation, reducing outages and commercial and technical losses, and modernizing the electricity distribution system; (2) the Regulatory Strengthening and Capacity Building Project, designed to promote sustainability, transparency, and accountability in the power sector through strengthening regulatory institutions and processes, reviewing and restructuring tariffs, and improving the environment for private sector investment; (3) the Access

Project, which targets MSMEs in markets and economic enclaves in urban and peri-urban areas with activities to increase legal connections and improve security lighting; and (4) the Energy Efficiency and Demand Side Management (EEDSM) Project, which seeks to improve building and appliance efficiency and reduce energy wastage through energy audits; standards and labels for energy efficient devices; upgrades to street lighting; and education and public information activities. The original design of the compact also covered the NEDCo Financial and Operational Turnaround Project (NFOT) which was designed to improve NEDCo's financial performance and customer service through private sector involvement in operational and commercial capacity building, infrastructure investments, and efforts to improve cost recovery. MiDA was not able to reach an agreement to move forward with this project, so it was de-scoped. Consequently, the funds are being reallocated, and we do not cover the project in this design report. The original design of the compact also included the Power Generation Sector Improvement (Generation) Project to diversify fuel sources for power generation through support for the gas sector and liquefied natural gas development and to strengthen the enabling environment for independent power producers (IPPs). The need for MCC assistance has been greatly reduced because the GoG is already undertaking reforms with support and technical assistance from USAID. As a result, MCC is not moving forward with this project and we do not cover it in this report.

MCC SECTOR
(Energy)

PROGRAM LOGIC
MCC's problem diagnostic identified two main issues limiting the efficiency and effectiveness of the Ghana energy sector: (1) low reliability of electricity supply and (2) insufficient access to power. The program logic for the Ghana II Compact addresses these issues. The activities are expected to achieve targeted power sector outcomes of increased availability, reliability, and expansion of cost-effective generation for all utility customers and increase the number of businesses, institutions, and households connected to the grid. The core compact activities consist of four main projects; the ECG Financial and Operational Turnaround Project, the Regulatory Strengthening and Capacity Building Project, the Energy Efficiency and Demand Side Management Project, and the Access Project. Together, these projects aim to reduce or eliminate sector inefficiencies and reliance on government subsidies, improving service as a result. If successful, these projects would improve the availability and quality of electricity to consumers while also improving the financial health of the utility. Outcomes from these activities support the Compact's goal of reducing poverty through sustainable and equitable economic growth by improving Ghana's power sector. The Regulatory project is designed to promote sustainability, transparency, and accountability in the power sector through strengthening regulatory processes, reviewing and restructuring tariffs, and improving the environment for private sector investment. Thus, this Project is designed to ensure that the power sector is financially self-sustaining and relies less heavily on cross-subsidies among tariff categories or other direct or implicit subsidies from the Government. The primary beneficiaries of this project are electric utility customers throughout Ghana, as well as their household members, enterprise employees, and enterprise customers. However, no beneficiary analysis was conducted for this project as all benefits were rolled up into the beneficiary analyses for the EFOT and NFOT projects. The regulatory project is composed of two main activities designed to improve regulators' capacity to monitor utility performance and to provide better information to help improve institutional and political support for tariff reform. The two activities include the Sector Performance Monitoring and Capacity Building activity and the Tariff Review and Regulation activity.

PROGRAM PARTICIPANTS
The primary beneficiaries of this project are electric utility customers throughout Ghana, as well as their household members, enterprise employees, and enterprise customers.

Sampling

Study Population

The evaluation will use a variety of data source for the regulatory project performance evaluation, including a combination of implementation and project records, administrative data, external surveys, and KIIs.

Sampling Procedure

We will conduct a longitudinal household and enterprise survey that covers the Greater Accra area as well as the next largest 7 cities in the ECG catchment area. We will work closely with GridWatch to ensure that our sample targets locations where they are collecting outage data, when possible, and so that we can avoid surveying the same households and enterprises covered in their baseline survey and so that we can take full advantage of the data they are collecting on outages and voltage fluctuations. We will work with Ghana Statistical Service (GSS) and the World Bank to develop two sampling frames-one for households and one for businesses. We will use a multi-stage sampling plan. First we will sample enumeration areas. Second, we will sample electric poles within enumeration areas. Third, we will sample households and enterprises served by those poles. We will oversample larger enterprises to improve the precision of our data for addressing the Economic Rate of Return calculations. We will conduct Key Informant Interviews and Focus Group Discussion to help enrich our understanding of key issues. The evaluation will have three rounds of data collection, baseline in 2019, a qualitative midline in 2021 near the end of the compact, and an endline starting in 2023.

We plan to sample 2,394 enterprises in the Greater Accra area and estimate a minimum detectable effect (MDE) of 0.12 standard deviations for enterprises in that area. The minimal detectable differences (MDD) are about half as large as the MDEs for binary outcomes such as, whether the entity has a legal connection. This outcome had a mean of around 0.5 in the baseline data for the Access project. This means that we should be able to detect changes in the fraction of enterprises with a legal connection as small as 0.06 between the baseline and follow-up surveys. Given MCC's greater interest in enterprises compared to households we are aiming for a much larger MDE for households, at around 0.21 in the Greater Accra area. We are expecting to have slightly larger MDEs, of about 0.24 standard deviations, when considering samples of enterprises from smaller geographic areas-in particular when looking only at the geographic areas targeted by one of the following interventions: new substations, bulk supply points, or line bifurcation. We will be able to address the possibility of spillover within the Greater Accra area somewhat more precisely as we expect an MDE of 0.15 for enterprises there. We will have just a bit less precision when looking at enterprises in the 7 largest cities in the ECG catchment area outside of Greater Accra, where we expect an MDE of around 0.17. This will enable us to say something about the degree to which PDS has impacts in areas where the MCC infrastructure is less likely to have made a difference. As noted above, we plan to coordinate with GridWatch so that we can obtain outage and voltage fluctuation data based on the PowerWatch devices for our survey samples in the Greater Accra area. We expect that this will require approximately 798 PowerWatch devices for the enterprise surveys and another 150 for the household surveys for a total of 948 PowerWatch devices. This is based on an assumption that we will have one transformer per EA and three PowerWatch devices per transformer. In doing these calculations we have assumed no overlap between the transformers used for the household and enterprise surveys. In reality, we expect that there will be some overlap which may enable us to add additional EAs and thereby further reduce our MDIs; however, if the number of devices available are near the estimated required number of 948, we recommend deploying them all appropriately between households and enterprises to help improve our ability to capture outages and voltage fluctuations. See Table X.2. in the EDR for more details.

Deviations from Sample Design

Not applicable for evaluation design report.

Response Rate

Not applicable for evaluation design report.

Weighting

Not applicable for evaluation design report.

Questionnaires

No content available

Data Collection

Data Collection Dates

Start	End	Cycle

Data Collection Notes

2019 (Baseline). 2023 (Endline).

Supervision

Unknown because data has not yet been collected.

Data Processing

Data Editing

Unknown because data has not yet been collected.

Other Processing

Unknown because data has not yet been collected.

Data Appraisal

Estimates of Sampling Error

Not applicable for evaluation design report.